

DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING

WILLIAM MAXWELL REED SEMINAR SERIES

“Toward Increased Partnerships between Humans, Robots, Automation, and AI”

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University of Louisville**

Abstract:

Examples of research work at our lab are presented to illustrate the state of the art in human-robot collaboration (HRC). One area of focus is delivering walking and sitting services with our home-grown robot nursing assistant (ARNA). Another is robotic interventions for Autism Spectrum Disorders using social robots. Robots were conceived and built with support from NSF’s PFI:BIC, SCH, NRI, EPSCOR, ICORPS, and FW-HTF programs over the last decade and they are housed at LARRI’s robotics facility in Louisville. The robots are adapting to the user via innovative controllers, namely the neuroadaptive controller (NAC) enabling physical HRC, the Genetic User Interface (GUI) enabling telemanipulation or remote HRC, and the Adaptive Motion Imitation (AMI) enabling social HRC. We summarize experimental results of testing our robots with nearly hundreds of human subjects, demonstrating acceptance and increased performance compared to traditional methods of hospital and home care.

Speaker Bio:



Dan O. Popa has over 30 years of research experience in robotics and automation. He is currently the Director of the Louisville Automation and Robotics Research Institute (LARRI) at UofL and the Head of the Next Generation Research Group (NGS). His early research work included adaptive force control and motion planning for nonholonomic robots. In 1998, he joined the Center for Automation Technologies at Rensselaer Polytechnic Institute, as a Research Scientist, where he focused on precision robotics and micromanufacturing. In 2004, he became an Assistant and then an Associate Professor of Electrical Engineering at the University of Texas at Arlington. Since 2016, he has been the Vogt Endowed Chair in Advanced Manufacturing and a Professor of Electrical and Computer Engineering at University of Louisville. Dr. Popa’s research is focused on two areas: 1)

social and physical human–robot interaction through adaptive interfaces, robot tactile skins, and facial expressions; and 2) the design, characterization, modeling, and control of microscale and precision robotic systems. Dr. Popa is the recipient of several prestigious awards and the author of over 300 peer reviewed conference and journal articles, mainly in IEEE and ASME publications. He has been very active in the IEEE Robotics and Automation Society (RAS), including extensive competition, workshop, conference, and journal service.

Date: Friday, March 29, 2024

Place: Whitehall Classroom Building 110

Time: 3:00 PM EST

Contact: Dr. Jonathan Wenk

Attendance open to all interested persons